

AGENDA

23rd Space Photovoltaic Research and Technology Conference

Tuesday, October 28, 2014

- 8:00 – 9:00 Breakfast and Registration
- 9:00 – 9:30 Introductory and Welcome Remarks
- 9:30 – 10:00 **NASA GRC's Power Division; New Organization Overview and Responsibilities** (Randall Furnas/NASA GRC)
- 10:00 – 10:10 **Overview of Photovoltaic Activities at NASA GRC**
(Michael Piszczor/NASA GRC)

Session I

III-V Cell Technology and Advanced Designs (Part I)

Session Chair: Jeremiah McNatt

- 10:10 **Next Generation Multi-junction Solar Cells and Arrays** (Mark Stan/Emcore)
- 10:30 **Next-Generation Space Solar Cells** (Nasser Karam/Spectrolab)
- 10:50 – 11:05 Break
- 11:05 **Towards the Optimization of AlGaInP-based Upper Sub-Cell Materials Grown on Tensile-Graded GaAsP Buffers for III-V Multi-junction Photovoltaics**
(Drew Cardwell/Ohio State University)
- 11:25 **Development of InAlAs Solar Cell towards Integration as Top Cell in Triple-junction Photovoltaic Designs** (Brittany Smith/Rochester Institute of Technology)
- 11:45 **Pilot Production of Lightweight, Multi-junction, Epitaxial Lift-Off Solar Cells on 6-inch GaAs** (Chris Youtsey/MicroLink Devices)
- 12:05 – 1:15 Lunch
- 1:15 – 1:30 Group Photo

Session II
Solar Electric Propulsion/Solar Advanced Systems
Session Chair: David Hoffman

- 1:30 **Solar Electric Propulsion Technology Overview**
(Thomas Kerslake/NASA GRC)
- 1:50 **Ground Validation of the ATK MegaFlex Solar Array**
(Mike Eskenazi/ATK Space)
- 2:10 **ROSA/Mega-ROSA Solar Array – Technology Maturation/Advancement Update** (Brian Spence/Deployable Space Systems)
- 2:30 **Canfield Joint Technology for Solar Array Pointing**
(Joe Beno/Balcones Technologies)

Session III
Solar Cell Characterization/Measurements and Flight Experiments
Session Chair: Michael Piszczor & Todd Peterson

- 2:50 **ER-2 Solar Cell Calibration Flights** (Matthew Myers/NASA GRC)
- 3:10 **Robotic Refueling Mission Solar Cell Experiment** (David Wolford/NASA GRC)
- 3:30 – 3:40 Break
- 3:40 **2014 Preliminary Commercial High Altitude Balloon Flight Results for Space Solar Cell Calibration** (Casey Hare/Angstrom Designs)
- 4:00 **OPTEC: A Cubesat for Solar Cell Calibration** (Geoffrey Landis/NASA GRC)
- 4:20 **Rapid Extended Defect Characterization in Semiconductor Heterostructures by Electron Channeling Contrast Imaging** (Tyler Grassman/Ohio State University)
- 4:40 **ISS Array Degradation Update** (Ann Delleur/NASA GRC)
- 5:30 – 8:00 **Picnic** (NASA GRC Mission Integration Center Auditorium)

Wednesday, October 29, 2014

7:30 – 8:30 Breakfast

Session IV

Advanced Blanket Technology and Cost Reduction Approaches

Session Chair: AnnaMaria Pal & Jeremiah McNatt

- 8:30 **Advanced Photovoltaic Power System Development at AFRL**
(David Wilt/Air Force Research Laboratory)
- 8:50 **Advanced Anti-reflection Coatings for Next-Generation Multi-Junction Photovoltaic Devices** (Victor Elarde/MicroLink Devices)
- 9:10 **Novel Solar Cell Coverglass and Metallization**
(Geoffrey Bradshaw/Air Force Research Laboratory)
- 9:30 **Photovoltaic Durability Innovation with Hybrid-Nanostructured Encapsulant and Sealant Material Systems and Processes**
(Alex Kawczak/StrateNexus Technologies)
- 9:50 **Cost Reduction of IMM Solar Cells by Recycling Substrates Using Wet Chemical Etching** (Chris Stender/MicroLink Devices)
- 10:10 **Automated Robotic Production of ROSA IMBA SPM / PV-Panel Assemblies**
(Tiffany Allmandinger/Deployable Space Systems)
- 10:30 – 10:45 Break

Session V

Advanced Array Technology and Concepts

Session Chair: Craig Myhre

- 10:45 **Development of More Robust Stretched Lens Array (SLA) Technology with Improved Performance Metrics and Significantly Expanded Applications**
(Mark O'Neill/MOLLC)

- 11:05 **Self Deploying Mirrors for Solar Power from Space** (Lewis Fraas/JX Crystals)
- 11:25 **Beam Shaping for an ISS-Based Long-Duration PV Power Transfer Experiment**
(Benjamin Leon/Georgia Institute of Technology)
- 11:45 **On the Design of a Picosatellite to Characterize the Surface of the Near-Earth Asteroid (99942) Apophis** (Aymeric Maros/Arizona State University)
- 12:05 Irving Weinberg Award Presentation
- 12:25 – 1:30 Lunch

Session VI

Radiation Studies and Environmental Effects

Session Chair: Barry Hillard & Joel Galofaro

- 1:30 **Annealing of Radiation Damage in Multi-junction Solar Cells**
(Paul Sharps/Emcore)
- 1:50 **Radiation Induced Defects of III-V Solar Cells embedded with InAs Quantum Dots** (Shin-ichiro Sato/JAEA/Naval Research Lab)
- 2:10 **Evaluation of Radiation Degradation of GaAs Solar Cells with InGaAs Quantum Dot Layers using Radiation Induced Current** (Takeshi Ohshima/JAEA)
- 2:30 **High-Efficiency Rad-Hard Ultra-Thin Si Photovoltaic Cell Technology for Space**
(Alex Fedoseyev/CFD Research Corporation)
- 2:50 **Anomalous GPS Power Degradation from Arc-Induced Contamination**
(Dale Ferguson/Air Force Research Laboratory)

3:10 – 3:20 Break

3:20 – 4:30 **Workshops**

1) Technology Development for Low Cost Photovoltaics

Chairs: AnnaMaria Pal & Craig Myhre

2) Solar Cell Measurement and Calibration Needs

Chairs: David Welford & Matthew Myers

3) Next Generation Photovoltaic Devices

Chairs: Geoffrey Landis & Sheila Bailey

6:00 – 8:30 **Banquet** (SoHo Kitchen and Bar, Cleveland, OH)

Thursday, October 30, 2014

8:00 Breakfast

Session VII

III-V Cell Technology and Advanced Designs (Part II)

Session Chair: Sheila Bailey & Geoffrey Landis

9:00 **Crystalline Defects Formation and Their Effect on Material Properties in Low-Lattice Mismatch III-V Compounds Grown by MBE on GaAs Substrates**
(Aymeric Maros/Arizona State University)

9:20 **Progress towards InAs/GaAs(Sb)/AlAsSb Quantum Dot Approach to the Intermediate Band Solar Cell** (Zachary Bittner/Rochester Institute of Technology)

9:40 **Temperature Dependent Carrier Lifetimes of InAs/GaAs Quantum Dot Solar Cells** (Paul Roland/University of Toledo)

10:00 **EBIC Studies of Effect of Irradiation on Gallium Arsenide Solar Cells with Multi Quantumwell Structures** (Sergey Maximenko/Naval Research Laboratory)

10:20 **Nanostructured Polymer Lithography for Photovoltaic Devices**
(Nicholas McKibben/Northwest Nazarene University)

10:40 **Development of nipi Solar Cells for High Radiation Environments**
(Michael Slocum/Rochester Institute of Technology)

11:00 – 11:15 Break

11:15 – 12:15 **Workshop Report Summaries**

12:15 – 12:30 Closing Statements, Conference Ends